ECONOMIC AND REGULATORY CONSEQUENCES OF THE CREATION OF NEW EMBEDDED DISTRIBUTORS

EVIDENCE OF

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BEFORE THE

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Toronto Hydro-Electric System Limited and Hamilton Hydro Inc., Hydro Ottawa Limited, Brantford Power Inc., Markham Hydro Distribution Inc., Hydro Vaughan Distribution Inc. and Enersource Hydro Mississauga Inc. (the LDC Coalition)

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1. INTRODUCTION

Q. PLEASE INTRODUCE YOURSELF TO THE BOARD.

A. My name is Adonis Yatchew. I am an Associate Professor of Economics at the University of Toronto. I completed my Ph.D. at Harvard University in 1980 and have taught at the University of Toronto since that time. In the course of my research and teaching career, I have held visiting appointments at various institutions including the University of Chicago and Cambridge University, UK. I am also a senior consultant to Charles River Associates.

Over the last 20 years I have conducted numerous studies on energy and on the electricity industry in particular. My research in econometrics and energy economics has appeared in recognized peer-reviewed journals. Recently, I have written papers on cost analysis of electricity distribution, incentive based regulation, and -- jointly with Professor Stephen Littlechild -- on separation of transmission and distribution functions.

For the last eight years I have been Joint Editor of The Energy Journal, where I am principally responsible for publications on the electricity industry. A detailed curriculum vitae is included as Appendix A to this testimony.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I have been retained by Toronto Hydro-Electric System Limited ("Toronto Hydro") and a coalition of local electricity distribution companies ("the LDC coalition") comprised of Hamilton Hydro Inc., Hydro Ottawa Limited, Brantford Power Inc., Markham Hydro Distribution Inc., Hydro Vaughan Distribution Inc. and Enersource Hydro Mississauga Inc., to assess issues relating to the proposal put forth by Wirebury Connections Inc. for new licensed, rate-regulated embedded electricity distributors. I have also been asked to provide an assessment of certain other service area amendment proposals involving existing LDCs.

2. SUMMARY OF TESTIMONY

Q. WHAT IS YOUR OVERALL ASSESSMENT OF THE PROPOSALS AND GUIDING PRINCIPLES BEING PUT FORTH FOR THE CREATION OF NEW EMBEDDED DISTRIBUTORS AND FOR SERVICE AREA AMENDMENTS?

A. Some of the proposals and guiding principles put before this Board could establish precedents which would profoundly alter the nature and structure of the distribution system in Ontario. The proposals need to be assessed from the broader perspective of the appropriate evolution of the structure of the distribution sector in Ontario. Moreover, whatever guiding principles the Board determines are appropriate, they should lead to stable and predictable changes within the industry.

Q. WHAT IS YOUR ASSESSMENT OF THE WIREBURY PROPOSAL?

A. The guiding principles and model proposed by Wirebury which would establish one or more utilities serving multiple discontiguous areas is wholly inappropriate and should be rejected.

First, there would likely be a detrimental impact on the economies of scale, density and contiguity within the industry. Contiguity continues to be one of the most critical features of efficient distribution system design and expansion, and should be maintained in all but exceptional cases.

Second, the potential for competitive benefits from the Wirebury proposal is very limited, principally because once connected, customers will not be contestable; that is, customers will not be able to switch electricity distributors in the way that they can switch cellular telephone carriers.

Third, there is substantial risk of structural instability in the industry as various entities seek to enter the bidding process with the purpose of "carving out" specific customers. Incumbent utilities will likely be obligated to create subsidiaries in order to "compete" with entities such as Wirebury and to prevent an erosion of rate base. Utilities might seek opportunities to bid for

"sweet spots" in the service territories of other utilities.[1] Even existing groupings of customers such as residential sub-divisions already connected to a distributor could demand similar treatment and the opportunity to secede and obtain distributor status. Moreover, structural instability, through its impact on expected cash flows, may actually hinder further rationalization in the industry, which continues to be a policy goal of the Province of Ontario.

Fourth, there is likely to be a detrimental impact on the capital planning and investment process. Uncertainty about service area boundaries and future customer growth could lead to sub-optimal capital investment decisions.

Fifth, there will be an increase in regulatory burden and the associated costs:

- there could be many applications for distributor status and rates;
- there may be many more "utilities" to regulate; [2]
- complex locational tariffs could emerge;
- capital expenditures may require increased regulatory scrutiny;
- there are likely to be disputes over "predatory behavior" which would need to be adjudicated.

Sixth, instability of service areas and customer base will increase revenue uncertainty. This combined with a likely increase in regulatory uncertainty could have a detrimental impact on credit ratings, borrowing costs and further LDC rationalization and consolidation.

Finally, the Wirebury proposal is inconsistent with Ontario government policy documents which have recognized the natural monopoly character of distribution and specifically recommended alternative mechanisms for incentive creation such as performance based regulation. The principle that electricity distribution is a natural monopoly is a conclusion that

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[1] In this scenario, large utilities such as Hydro One and Toronto Hydro may have particular advantage because of their size and financial depth.

[2] If new "distributors" sub-contract their activities to third parties, which appears to be the business model proposed by Wirebury, there may be yet another layer of entities to license or regulate.

jurisdictions around the world have drawn in connection with the restructuring of their respective electricity sectors .

Q. WHAT ARE YOUR VIEWS ON APPLICATIONS WHICH INVOLVE EXPANSIONS INTO CONTIGUOUS TERRITORY?

A. Applications involving changes in service areas which do not create discontiguities differ from proposals for new embedded distributors in at least two fundamental ways.

First, the applicants typically are established utilities that serve a contiguous area. Second, if expansion is into a bordering region, the issues of dilution of density and discontiguity are unlikely to be present. Thus, while the arguments against the Wirebury model are compelling, other service area amendment proposals require consideration of a more subtle set of issues.

Nevertheless, all the applications have one very important common feature -- none will create sustained competition in distribution for the simple reason that once connected, the overwhelming majority of customers will be uncontestable.

Q. SHOULD OVERLAPPING SERVICE AREAS BE APPROVED?

A. In my view, overlapping service areas should not be permitted, except perhaps on a temporary basis or by mutual agreement of neighboring incumbent utilities. Overlapping service areas could contribute to the dilution of customer density. They could also result in sub-optimal planning and capital expenditures as "competing" utilities "race for the border" or engage in other gaming to try to capture future customers.[3]

[3] Indeed, following similar reasoning, the Ontario Market Design Committee recommended that the industry be organized into exclusive franchise areas (see section 5.4, below).

If it is unlikely that the incumbent utility will be able to economically service the area under consideration in the foreseeable future, then an application should be made for a change in service area boundaries.

Q. WHAT KEY CONSIDERATIONS SHOULD GUIDE DECISIONS ABOUT SERVICE AREA AMENDMENTS?

A. First, service area amendments should not compromise scale or density economies of distributors. Discontiguities should not be created except in exceptional cases.

Second, regulatory uncertainty about service area amendments should be minimized to the extent possible. It would be desirable if the regulator would have a clearly expressed position on how the distribution industry should evolve over time.[4] It would also be very beneficial if the regulator were to establish a clear set of conditions under which a service area amendment would be considered and what standards would need to be met.

Third, service area amendments should not be a routine and common occurrence. They should be undertaken only if a compelling case can be made that the proposed changes serve the public interest.

Fourth, the rules for service area amendments should lead to stable and predictable changes in industry structure.

3. ECONOMIC CONSIDERATIONS

3.1 Factors Affecting the Costs of Distribution

Q. WHAT FACTORS AFFECT THE COST OF DISTRIBUTING ELECTRICITY?

[4] The difficulty in meeting this objective may be that a consensus on the optimal structure for distribution in Ontario has, to my knowledge, not been reached.

A. The costs of distribution depend on a variety of variables. Among the most important are:

- the number of customers served, that is the *scale* of operation;
- the *density* of the customer base and their *spatial distribution*;
- capital costs – particularly the costs associated with fixed distribution assets and financing costs;
- labour costs, in particular wage rates and other labour related costs, and the cost of materials;
- characteristics of the distribution system such as the age of the assets and whether distribution lines are above or below ground.

Q. ARE THERE OTHER FACTORS THAT AFFECT DISTRIBUTION COSTS?

A. Other relevant factors include the customer mix, that is the relative proportion of industrial, commercial and residential customers; the load factor; and the volume of consumption per customer. Weather and climactic conditions can also have significant impacts on distribution costs.

3.2 Scale and Contiguity

Q. WHY IS THE SCALE OF OPERATION AN IMPORTANT DETERMINANT OF COSTS?

A. The distribution of electricity has high fixed costs. As the scale of operation increases, these fixed costs are spread over a larger number of customers. Very small distributors are

therefore likely to have higher costs per customer than larger utilities. In economic language, there are substantial scale economies in the distribution of electricity.

Q. HOW DOES THE DENSITY OF CUSTOMERS AFFECT COSTS?

A. In areas of low customer density, capital and maintenance costs are higher. Indeed, low density is a major factor contributing to higher costs of distribution to rural customers. On the other hand, distributors that serve a single self-contained compact area with high customer density can be expected, *ceteris paribus* to have lower costs.

Q. HOW DOES CONTIGUITY OF THE SERVICE AREA AFFECT COSTS?

A. Consider two utilities, each having the same number of customers. The first serves a single contiguous area. The second serves multiple discontiguous areas. The latter will likely have higher capital costs, as its infrastructure is spread over a larger area and higher maintenance and labour costs as equipment and crews need to travel longer distances to provide service. Indeed fragmented or discontiguous utilities share some of the cost characteristics of low density utilities (such as rural utilities) -- more resources are required to provide the same level and quality of service as those achievable at higher density utilities.

Q. WHAT IS THE BASIS UPON WHICH YOU HAVE COME TO THESE CONCLUSIONS?

A. I base my conclusions on empirical analyses of distributor costs that have been performed on data from Ontario, Norway, New Zealand and Switzerland.

Q. WHY DO YOU CHOOSE TO FOCUS ON DATA FROM THESE JURISDICTIONS?

A. While there are many empirical studies which analyze the electricity industry as a whole or the generation segment specifically, there are few which deal principally with distribution. There are at least three reasons for this. First, many regulatory jurisdictions have too few distinct entities engaged in distribution to permit serious statistical analysis. Second, multi-jurisdictional analyses are complicated by varying accounting practices and differing definitions of distribution. Third, where distribution is part of a vertically integrated utility -- and this has been frequently the case -- a clear and comparable separation of distribution costs from those of other stages of production is typically not available.

On the other hand, Ontario, Norway, New Zealand and Switzerland have multiple distributors. Statistical analyses of the costs of distribution have been performed. Moreover, the studies upon which I base my conclusions have undergone a "peer-review" or "refereeing" process. Three of the studies (Ontario, Norway and Switzerland) have been published in reputable journals, the fourth (the New Zealand study) was published in a book edited by a leading econometrician.

Q. WHAT IS THE "PEER-REVIEW" PROCESS AND WHY IS IT IMPORTANT?

A. Peer-reviewed journals provide one of the most important mechanisms for testing the quality of research throughout the sciences, social sciences and humanities. When a paper is submitted to a peer-reviewed journal, the editors select suitable reviewers or "referees" who provide their opinion on the paper. Based on the reviews, the editor decides whether to publish the paper. As with any other "quality control" process, the system is not perfect. However, publication in a leading peer-reviewed journal[5] usually indicates that the analysis is of high quality. As Joint Editor of the Energy Journal, I rely on this process extensively to test the quality of analyses so that the articles that we publish are of the highest possible quality.

[5] It is worth noting that within the journal system there is a well-recognized hierarchy. Publication in the most respected journals usually carries the greatest credibility.

3.3 Empirical Evidence

3.3.1 Ontario

Q. WOULD YOU PLEASE DESCRIBE THE DATA USED TO PERFORM THE STATISTICAL ANALYSIS FOR ONTARIO DISTRIBUTORS.

A. The analysis involved data on 81 municipal distribution utilities in Ontario representing about 70% of the municipal utility customer base at the time. The utilities were selected on the basis of data availability.[6]

Q. WOULD YOU PLEASE DESCRIBE THE MODEL.

A. The purpose of the modeling was to analyze the relationship between distribution costs per customer and a series of variables measuring the following effects:

- the size of the distributor as measured by the number of customers; the purpose of this variable was to capture the "scale effect", that is, to estimate scale economies
- capital costs
- the cost of labour
- remaining lifetime of physical assets
- load factor
- density of the customer base
- volume of electricity usage per customer

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[6] See A. Yatchew, 2000, "Scale Economies in Electricity Distribution: A Semiparametric Analysis", Journal of Applied Econometrics, 15, 187-210. A copy of the paper is attached as Appendix B to this testimony.

- a variable indicating whether the company provided services other than electricity distribution.

A number of variants were estimated to assess the validity and stability of the results.

Q. WHAT WERE THE STATISTICAL CONCLUSIONS WITH RESPECT TO ECONOMIES OF SCALE?

A. The data reveal strong evidence of increasing returns to scale with minimum efficient scale being achieved by firms with about 20,000 customers. Larger firms exhibit constant or decreasing returns.

Q. IN YOUR OPINION, HAS MINIMUM EFFICIENT SCALE CHANGED SINCE THE TIME THESE DATA WERE COLLECTED?

A. I am not aware of any substantial technological change in the distribution of electricity that would cause the minimum efficient scale of operation to decline dramatically since the time these data were collected. On the other hand, the establishment of an electricity market and Independent Market Operator has led to additional tasks that need to be performed by distributors, which in turn would tend to drive up minimum efficient scale.

Q. WHAT ARE THE STATISTICAL CONCLUSIONS REGARDING DENSITY EFFECTS?

A. The density of the customer base has a strong statistically significant impact on costs. As density increases, distribution costs per customer generally decline. This kind of density effect has been recognized historically in other jurisdictions and has led to what is sometimes termed "density rates".[7]

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[7] The "rural rate assistance program" and the density rates charged by Hydro One comprise examples of such rates in Ontario.

Q. WHAT OTHER VARIABLES HAVE A SIGNIFICANT IMPACT ON COSTS ?

A. Capital costs have a strong impact on total distribution costs. This is not surprising given the high fixed costs within the industry.

The remaining life of physical assets also has a material and statistically significant impact on costs. The results of the modeling indicate that there is a strong age-related effect and that utilities with aging infrastructure will tend to exhibit higher costs.

A number of distributors in the data set are part of local Public Utility Commissions which deliver additional services such as water and waste water services. One might expect cost savings through sharing of certain functions. This is indeed consistent with the statistical results which indicate that such economies of scope are present.[8]

Q. PLEASE SUMMARIZE THE RELEVANCE OF THESE STATISTICAL RESULTS FOR THE ISSUES BEFORE THIS BOARD.

A. First, the presence of significant economies of scale suggests that one would not want to encourage the proliferation of small new distributors, whether they are stand alone entities or subsidiaries of existing distributors.

Second, since increasing customer density has a favorable effect on costs, it would be inadvisable to encourage the creation of distributors serving dispersed pockets of customers over discontiguous areas. Nor would it be advisable to otherwise dilute the density of existing distributors by creating a spatial distribution of service areas that resembles what some have aptly called a "Swiss cheese" pattern.

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[8] See Yatchew (2000), op.cit., coefficient of *PUC* in Tables 1 and 2. See also A. Yatchew (2003), Semiparametric Regression for the Applied Econometrician, Cambridge University Press, New York, pages 76-81, Appendix C to this testimony.

Third, there is a significant age effect suggesting that new facilities – for example, the distribution wires running through a new sub-division – should have lower associated maintenance costs. This would explain in part why they are attractive as targets for acquisition by distributors.

3.3.2 Other Jurisdictions

Q. PLEASE DESCRIBE THE RESULTS OF STATISTICAL ANALYSES FOR OTHER JURISDICTIONS.

A. As stated earlier, I have focused on three other jurisdictions for which there are detailed statistical analyses of distributor cost data which have undergone a "peer-review" process. In each jurisdiction, distributors typically serve well-defined contiguous areas.

The Norwegian analysis included approximately 100 distributors ranging in size from 650 to 290,560 customers. It found that minimum efficient scale occurred at about 20,000 customers. Moreover, the study found significant benefits from increasing density. [9]

The analysis of New Zealand distributors covered 60 companies ranging in size from 600 to 220,000 customers. That study concluded that "...any output in the range 500-3500 gwh is essentially consistent with minimum A[verage] C[osts]."[10] I subsequently obtained New Zealand distributor data and found that the implied minimum efficient scale corresponds to about 30,000 customers.

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[9] See K. Salvanes and S. Tjotta (1994), "Productivity Differences in Multiple Output Industries", Journal of Productivity Analysis, 5, 23-43. This paper may be found in Appendix D of this testimony.

[10] D. Giles, D. and N.S. Wyatt, (1993): "Economies of Scale in the New Zealand Electricity Distribution Industry", in Models, Methods and Applications of Econometrics, ed. P.C.B. Phillips, Blackwell, 370-382. See Appendix E of this testimony.

The analysis of Swiss distributors involved a somewhat more limited dataset of 39 companies.[11] The author finds that scale economies appear to be exhausted by utilities with approximately 30,000 customers but economies of density are present throughout the sample. The latter implies that increasing customer density would continue to yield cost savings even for those utilities serving relatively more concentrated populations.

Q. WHAT IS THE RELEVANCE OF THESE STATISTICAL RESULTS FOR THE ISSUES BEFORE THIS BOARD?

A. The results from these jurisdictions confirm that there are significant economies of scale in electricity distribution and that minimum efficient scale would appear to require at least 20,000 customers. Perhaps more important, there are significant economies of density in the distribution of electricity.

3.4 Key Economic Considerations

Q. PLEASE OUTLINE WHAT YOU WOULD CONSIDER TO BE KEY ECONOMIC ELEMENTS OF A CONCEPTUAL FRAMEWORK FOR ASSESSING APPLICATIONS FOR EMBEDDED DISTRIBUTOR STATUS AND SERVICE AREA AMENDMENTS?

A. In a competitive market setting, the number of firms, their size and spatial distribution is determined by competitive forces.

On the other hand, where there is natural monopoly, industry structure is driven by a confluence of economic, historic, regulatory and political forces and not by direct competition. As a result, the existing industry structure may not be optimal from a public policy point of view. For example, there may be too many or too few firms, some firms may be vertically

[11] M. Filippini, (1998): "Are Municipal Utilities Natural Monopolies?", Annals of Corporate and Public Economics, 69, 157-174. This paper may be found in Appendix F of this testimony.

integrated (e.g., utilities providing generation, transmission and distribution services) which in turn complicates the task of separating competitive and monopolistic segments, or in some instances the geographic shape of a service area may be sub-optimal.

In considering a desirable or optimal industry structure, two key principles flow from the empirical evidence that has been described above:

1. **In order to promote optimal industry structure distributing utilities should, wherever possible, achieve minimum efficient scale.**

2. **Discontiguities in utility service areas should be minimized as far as possible.**

Q. WITH RESPECT TO THE FIRST PRINCIPLE, ARE THERE CIRCUMSTANCES WHERE A UTILITY WHICH DOES NOT ACHIEVE THE STATISTICAL ESTIMATE OF MINIMUM EFFICIENT SCALE, COULD STILL BE EFFICIENT?

A. Yes there are exceptional cases. Consider for example a municipality which lies in a large very sparsely populated region. For the sake of this illustration, suppose that the municipality has 5,000 electricity customers and the estimate of minimum efficient scale is 20,000 customers. Given the geographic population pattern, it is not possible for the utility to achieve minimum efficient scale by expanding its service territory as there is insufficient population in regions contiguous to the municipality. In this case, the utility has achieved its optimal size.

On the other hand, suppose a municipal utility with 5,000 customers is contiguous to a larger utility, say with 15,000 customers. Then a merger between the two would achieve minimum efficient scale and should be encouraged. Moreover, the merger would be consistent with the policy goals of the Province of Ontario.

Q. WITH RESPECT TO THE SECOND PRINCIPLE, WHAT IS THE EMPIRICAL FOUNDATION UPON WHICH YOU BASE THIS CONCLUSION?

A. First, I am not aware of any peer-reviewed statistical studies which analyze the efficiency of utilities which serve many small discontiguous areas. I believe this to be the case because worldwide, electricity distribution industries overwhelmingly are comprised of utilities serving contiguous areas. Furthermore, this evolution towards contiguity has not been accidental. On the contrary, contiguity has been a critical feature of efficient distribution industry structure. Public policy, while inevitably imperfect, has not encouraged discontiguity *because* it is inefficient.

Put another way, if contiguity were not an essential feature of efficiency, then one would observe cities like Toronto with a checkerboard pattern of service areas belonging to two or more distinct utilities. The very fact that we do not observe such utilities, comprises strong empirical evidence of their sub-optimality.

Second, the empirical evidence that is available indicates that there are substantial returns to density. To the extent that discontiguity implies greater distance between customers or groups of customers of a given utility, the economic benefits of density are reduced.

Q. CAN THERE BE EXCEPTIONS TO THE SECOND PRINCIPLE?

A. One possible exception is a utility which has the obligation to serve large expanses of sparsely populated territory such as Hydro One. In this case, optimal industry structure may include one or more utilities which specialize in rural distribution and whose service territories have a "Swiss cheese" type structure. The "holes" in the cheese, however are municipal utilities which themselves should achieve minimum efficient scale wherever possible and serve customers over a more or less contiguous area.

4. REGULATORY CONSIDERATIONS

4.1 Overview

Q. WHAT REGULATORY CONSIDERATIONS SHOULD BE KEPT IN MIND IN ESTABLISHING GUIDING PRINCIPLES AND DEVELOPING A FRAMEWORK FOR ASSESSING PROPOSALS FOR THE CREATION OF NEW EMBEDDED DISTRIBUTORS AND FOR SERVICE AREA AMENDMENTS?

A. There are a number of important proposals before this Board at this time. The approval of some of them would establish guiding principles which would in all likelihood be followed by similar applications in the future. This, in turn, could fundamentally alter the structure and regulation of distribution in Ontario. In assessing the applications and developing a framework or principles to guide assessment of future applications, the following questions need to be asked and answered:

1. What is the likely impact on industry structure? Will the proposals, if implemented, promote or hinder evolution towards an optimal industry structure?

2. Will implementation simplify or complicate the regulatory process? Will it increase or reduce regulatory burden?

3. Will implementation promote traditional objectives of regulation such as cost efficiency and efficient capital expenditures?

4. What are the likely customer impacts?

Q. IS IT IMPORTANT TO ENSURE THAT THE GUIDING PRINCIPLES AND REGULATORY RULES FOR SERVICE AREA AMENDMENTS ARE SET CORRECTLY?

A. Yes. It is of critical importance to ensure that the principles approved by the Ontario Energy Board lead to *stable and predictable changes within the industry*. Perhaps the most prominent and relevant recent examples of major shortcomings in deregulation are the

electricity industry restructurings that took place in California and Ontario. In each case, a major factor contributing to the subsequent problems was the initial institutional structure and regulatory rules that were implemented. Market power in generation was a major impediment to competition. The failures occurred despite the fact that the deregulation in the U.K. which had occurred earlier, provided a reasonable precedent and significant empirical evidence upon which to base a market design.[12]

In the case of electricity distribution, I am not aware of substantial experience elsewhere with the kinds of changes being proposed by Wirebury. Thus, the consequences of changes in rules need to be thought through very carefully. It may be that some of the effects are completely unintended.

Q. HAVE THERE BEEN TECHNOLOGICAL ADVANCES IN THE DISTRIBUTION OF ELECTRICITY THAT WOULD PERMIT COMPETITION?

A. It would appear that to the extent that changes have occurred in distribution, they would tend to increase the potential for scale economies, particularly at the end of the spectrum populated by small utilities. Indeed, this would help to explain the consolidation that has taken place amongst small distribution utilities within the Province.

At this time it would appear that the most likely source of "competition" for distributors in the foreseeable future will not come from alternate distributors but from "distributed generation", that is small generation facilities which are located at the site where the electricity is consumed thereby avoiding use of the transmission and distribution network. However, distributed generation does not as yet comprise a significant portion of supply though recent Government directives in Ontario are intended to encourage more supply from such sources.

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[12] Moreover, research in the early 1990's which was published in leading economics journals, essentially predicted the difficulties that would arise as a result of failure to address issues of market power. See R.J. Green and D.M. Newbery, (1992) "Competition in the British Electricity Spot Market", Journal of Political Economy, 100(5), October, 929-53.

Restructuring in the generation segment of electricity industries has been driven in part by technological changes which have fundamentally altered scale economies in generating electricity.

Restructuring and deregulation in telecom has occurred primarily because of the advent of new technologies which have eliminated natural monopolies and have permitted "leapfrogging" of existing infrastructure. In contrast, there have been no commensurate technological advancements in the distribution of electricity which would form the basis for direct competition in the wires business or the elimination of natural monopoly.

Q. HOW SHOULD CUSTOMER PREFERENCES INFLUENCE DECISIONS ABOUT THE ELECTRICITY DISTRIBUTION INDUSTRY?

A. In competitive markets, prices, the characteristics of goods and services, the levels and types of investment, and even market structure and evolution are determined by market forces. Many participants on the demand side and on the supply side interact to determine these market outcomes. Consumer preferences are expressed and given proper weight through the competitive process.

Indeed, it is a fundamental theorem of economics that competitive markets deliver outcomes that are economically efficient. In such settings, the *direct* expression of customer preference through the choices that they make in the marketplace plays a central role in shaping an industry. Thus, it is not surprising that terms such as "customer choice", "customer preference" and "customer sovereignty" have become commonplace in discussions of deregulation.

In markets that are not inherently competitive, such as is the case with electricity distribution, the direct expression of preferences through customer choice can at best have very limited impact. This is because customers cannot switch suppliers or "exit" to express displeasure.[13]

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[13] Though, there is some limited potential for inter-jurisdictional competition in electricity, particularly for large customers which can be attracted to a low-cost high-reliability system. Indeed, it has been argued that there is such competition internationally – in particular, that price and reliability of electricity is a relevant factor in the location decision of large industrial customers that use electricity intensively in their production process.

In such markets, customer preferences are expressed through political and regulatory processes and customer interests are typically protected by a regulator. It is ultimately the regulator, and not the market, that tries to ensure that individual customer preferences and interests are properly balanced. Thus, customer preferences continue to play an important role but not through the same mechanisms that are available in competitive markets.[14]

Q. WHAT WEIGHT SHOULD CUSTOMER PREFERENCE BE GIVEN IN ASSESSING SERVICE AREA AMENDMENT APPLICATIONS?

A. It would seem that new customers seeking connection represent one of the few occasions where there may be a real choice between distributors. If the full consequences of making a choice were borne by the specific customer, then customer preference should arguably receive considerable weight in assessing applications for service area amendments.

However, this is generally not the case in electricity distribution. Network costs cannot be fully allocated to individual customers on a cost causality basis. Nor are network services usually priced at marginal cost. Rates typically reflect average costs across the network and across a customer class. In the result, the preferences of particular customers or groupings of customers may be sub-optimal from the point of view of the network as a whole.

Q. CAN YOU GIVE AN EXAMPLE WHERE THE PREFERENCES OF SPECIFIC CUSTOMERS SHOULD BE SECONDARY TO BROADER NETWORK CONSIDERATIONS?

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[14] For example, the Ontario Energy Board Act, Section 1 prescribes specific objectives which the Board is obligated to consider in carrying out its responsibilities under the Act. These objectives include:

> "To protect the interests of consumers with respect to prices and the reliability and quality of electricity service.
>
> To promote economic efficiency in the generation, transmission and distribution of electricity; and
>
> To promote the maintenance of a financially viable electricity industry."

A. Yes. Applications for embedded distributor status ostensibly based on "customer choice", where the creation of the embedded distributor has a detrimental effect on overall costs in the industry by reducing economies of scale and density comprise one such example.

4.2 Imperfections in the Regulation of Distributor Rates and Costs

Q. HOW ACCURATELY DO REGULATED RATES REFLECT THE TRUE COSTS OF DISTRIBUTING ELECTRICITY?

A. At an aggregate level, the rates charged by distributors, which are regulated by the Ontario Energy Board, should provide a reasonable reflection of the costs of distribution. That is, rate levels should fairly reflect average costs.

However, regulation – just as competition – inevitably has "imperfections". Among these are pricing at average rather than marginal cost; and establishing rates based on average characteristics of a customer class rather than on the specific attributes of each customer. For example, there is strong statistical evidence that distribution costs increase with the age of assets. [15] Thus, in the early years, one would expect distribution facilities for new sub-divisions to attract lower O&M costs than older parts of the system.

Such "imperfections" often arise in part because of the difficulty in attributing costs to customers on an individual basis. Indeed, in physical networks, cost attribution is particularly difficult since the cost of serving the "next customer" typically depends on the spatial distribution of existing customers. Inevitably, regulators must make trade-offs between practicability and expending ever greater efforts to try to attribute costs in progressively refined detail.

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[15] See A. Yatchew (2000), op. cit. The coefficient of the variable "*life*" which measures the remaining life of distribution assets in Tables I and II is negative and strongly statistically significant, implying that newer assets are less costly to maintain.

In short, as a result of cost averaging, rates do not always accurately reflect the costs of servicing each customer at a specific point in time.

Q. WHAT ARE THE CONSEQUENCES OF THESE IMPERFECTIONS?

A. Since rates reflect *average* costs, rates on some parts of the system may be higher than the incremental costs of adding and serving new customers; on other parts of the system rates may be lower. As a result, a "competitor" that offers to serve a new development at rates at or below those of the incumbent could be reducing rather than increasing the overall economic efficiency of the system. Efficiency will be reduced if the incumbent, as a result of economies of scale, density or contiguity, has lower incremental costs of servicing the area than the entrant, but the entrant obtains the right to service on the basis that his incremental costs are lower than the incumbent's rates which reflect average costs.

Put another way, the new entrant has an unfair advantage *because he can selectively choose those locations where regulated pricing imperfections work to his advantage* even though his (incremental) costs of servicing the area are higher than the utility's incremental costs.

Q. CAN THIS PROBLEM BE REMEDIED?

A. An option to consider would be the development of a system of regulated locational rates which would attempt to more accurately reflect the costs of distribution to individual locations, thus sending more accurate price signals. Aside from the usual difficulties in attributing costs within a network which consists of many interacting components, there would likely be enormous administrative and regulatory complexities in determining "fair" rates.

A second option would be to permit utilities to determine their own locational rates subject to the constraint that *average* rates not exceed the regulated level. This too, however, would likely have significant disadvantages as customers whose rates increase are likely to argue that locational rates are discriminatory. Moreover, a new entrant, in competing for new customers, may accuse the incumbent of predatory pricing practices or cross-subsidization.

Indeed, I am not aware of other jurisdictions that have adopted locational distribution rates of the kind described here.[16]

4.3 Licensing of New Embedded Distributors

4.3.1 The Wirebury Proposal

Q. PLEASE SUMMARIZE THE WIREBURY PROPOSAL AS YOU UNDERSTAND IT.

A. The core of the Wirebury proposal is in Paragraph 4 of the Evidence of Wirebury Connections Inc.:

> "Wirebury is a new company established to operate as an embedded distributor. It has applied to the Board for an electricity distribution license and plans to own and operate distribution assets. Wirebury will enter into connection agreements with land and building owners and/or developers and connect its distribution system to that of its host distributors. More specifically, Wirebury will operate as an embedded distributor in respect of multi-unit condominiums and rental buildings and for new sub-divisions."

Q. WHAT IS YOUR ASSESSMENT OF THE APPROPRIATENESS OF THIS PROPOSAL?

A. The creation of utilities such as proposed by Wirebury, which will serve multiple discontiguous areas would not serve the public interest. My conclusion is based on the empirical evidence that I have described earlier: in particular, the scale economies associated

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[16] This is in contrast to locational or nodal pricing of electricity *supply* which has been implemented elsewhere. The reason it is effective there is because the locational prices are determined in *competitive* markets for supply and not by a monopolist or a regulator.

with distribution systems and the critical role that contiguity plays in driving technological and economic efficiency.

Q. WOULD ONE EXPECT A COMPANY SUCH AS WIREBURY TO EXERT COMPETITIVE PRESSURES ON DISTRIBUTORS?

A. Competitive pressures, to the extent that they may emerge are likely to have limited effect because the Wirebury proposal for embedded distribution will not produce *sustained* incentives for efficiency beyond those that already exist. The reason is that once customers have been acquired by a utility, and the utility owns the associated distribution assets, the potential for customer mobility will be little more than it is today.

Put another way, new customers will effectively have only one opportunity to choose, after which they will be captive to the utility and will require the same regulatory oversight and protection that is required today.

Moreover, as Wirebury has indicated, the selection of the distributor for new sub-divisions will be made by developers not the subsequent home owners. To the extent that the interests of developers and homeowners do not coincide, the ultimately affected party – that is the homeowner -- will not even benefit from the opportunity to make the initial choice.

4.3.2 Contestability

Q. WHAT POSITION HAS BEEN EXPRESSED BY WIREBURY WITH REGARD TO SUSTAINED COMPETITIVE PRESSURES WITHIN THE DISTRIBUTION INDUSTRY?

A. The Evidence of Wirebury Connections Inc. states:

> "In Wirebury's opinion, existing customers and customers attaching within the confines of the distributors distribution system should not be treated as captive customers who are

offered no choice but to attach to the incumbent distributor regardless of the service offering." (Paragraph 54.)

This would seem to imply that customers of existing utilities would be contestable under the Wirebury model and that this would in turn exert competitive pressures within the industry.

On the other hand, in response to LDC Coalition Interrogatory #7, Wirebury filed a report prepared by Mr. John Todd (henceforth the Todd Report). That report states:

> "Once a distributor connects a location that is unserved or underserved, it will become "served" and will therefore become uncontestable in the market." (Todd Report, page 13, lines 19-20.)

Moreover, the author states that "...there is general agreement that it is in the public interest to ensure that an "area" once served, is operated and regulated as a monopoly,..", (page 6, lines 22-24).

What appears to be yet a third position is expressed in Wirebury's response to LDC Interrogatory #23 which states that

> "A location would only become contestable, if at a later date it again became 'unserved or underserved' due to technological change or redevelopment of the location."

Now, it is possible to interpret virtually any service enhancement, no matter how minor, as technological change, in which case, under this interpretation, all customers would be perpetually contestable.

Q. WHAT IS YOUR VIEW OF THE POTENTIAL FOR CUSTOMER CONTESTABILITY?

A. As a practical matter, the overwhelming majority of customers will be uncontestable and as a consequence, there will be minimal sustained competitive pressures within the industry under the Wirebury model. Unlike the cellular telephone where multiple networks can exist

within the same geographic area – that is, service areas can overlap or even coincide -- the electricity customer has no alternative network to choose once a connection is established.

4.3.3 Capital Planning and Regulation of Capital Expenditures

Q. WHAT ARE THE CONSEQUENCES OF THE WIREBURY MODEL FOR CAPITAL PLANNING DECISIONS?

A. The Wirebury proposal has the potential for inducing sub-optimal capital expenditures. Network planning decisions involve consideration of multiple factors including the current spatial pattern of distribution assets, its strengths and weaknesses, as well as uncertainties regarding future load growth and its spatial pattern.

The creation of new embedded distributors serving pockets of customers in multiple locations will require a further level of planning and coordination between the embedded distributors and the surrounding utilities. Currently, such planning can often be conducted on a cooperative basis with relatively modest regulatory scrutiny because the host and embedded utility are usually not competing with each other for customers.

Moreover, under the Wirebury proposal, embedded distributors would not only serve multiple discontiguous distribution areas dispersed across one or more host utilities, but the service areas could change over time. This, in turn, would introduce another source of uncertainty into the network planning problem as host utilities may need to anticipate network development by the embedded distributor(s).

Q. HOW WOULD THE WIREBURY MODEL AFFECT REGULATION OF CAPITAL EXPENDITURES?

A. It is reasonable to expect that substantially greater regulatory oversight of capital expenditures would be required as the embedded distributor will want the host to make investments which reduce present or future costs for the embedded distributor. For example,

an embedded distributor seeking to acquire customers in new sub-divisions will want the host to build lines in close proximity to land which is likely to be developed even if this is not in the broader public interest.

This will likely lead to a need for additional regulatory supervision. Moreover, in the absence of perfect adjudication by the regulator, there is risk of plant duplication and overlap or otherwise sub-optimal capital expenditures. Under the present system, while errors can be made, capital planning within a distributor's service area does not typically require a dispute resolution process.[17]

It should be kept in mind that the Wirebury proposal contemplates "choice" for existing customers of utilities, not just new ones. Under average cost pricing, the incumbent could be at an unfair disadvantage relative to an embedded distributor that can selectively offer to serve low-cost customers. If the host utility cannot compete fairly with respect to price, it may have the incentive to exploit other means of retaining current low-cost customers or to gain new ones, such as through strategic capital expenditures. This could also lead to a greater need for regulatory supervision.

4.3.4 Potential Responses By Existing Utilities

Q. WHAT RESPONSE WOULD YOU ANTICIPATE FROM EXISTING DISTRIBUTORS IF THE WIREBURY MODEL PRINCIPLES WERE TO BE ADOPTED BY THE ONTARIO ENERGY BOARD?

A. One possible response would be for existing utilities to form subsidiaries to "compete" with new embedded distributors. This would likely result in a substantial increase in regulatory burden.

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[17] Though building of new *transmission* corridors has in the past led to high-profile disputes. For a number of years, there was "locked-in" energy at Bruce as a result of opposition by environmental and other citizen groups to the paths of proposed transmission corridors.

A second possible response to "cherry picking" of low cost customers by a new embedded utility would be for existing utilities to charge rates to new customers based on the incremental cost of service rather than based on average cost of service. However, this would lead to a complex locational tariff structure across all customers which would be difficult to administer and even more difficult to regulate. Moreover, it could be seen to be discriminatory if there is differential treatment of existing and new customers.

In either case, there would inevitably be disputes about "uncompetitive" or "predatory" behavior which would need to be resolved by the regulator.

Approval of the Wirebury proposal may also have some unexpected or unintended consequences. Under the new rules, existing utilities, particularly those with greater financial clout, may find it in their interest to bid for "sweet spots" in each other's service territories, further contributing to a proliferation of discontiguous pockets of service. Indeed, it may be that the largest utilities such as Hydro One or Toronto Hydro would be in the strongest position to reshape the spatial pattern of service territories. In any event, the new equilibrium structure would be difficult to predict.

4.3.5 Economic and Regulatory Consequences of the Wirebury Model

Q. WOULD YOU PLEASE SUMMARIZE THE ECONOMIC CONSEQUENCES OF THE WIREBURY PROPOSAL.

A. The creation of new embedded distributors serving multiple discontiguous areas would likely have the following effects:

- There would be a detrimental impact on the economies of scale, density and contiguity within the industry.
- There would likely be an increase in capital planning uncertainty and the potential for increased capital costs.
- There could be substantial and destabilizing change in the spatial pattern of service areas.

- If service territories are unstable, there could be substantial customer rate impacts for remaining customers of existing utilities if "low-cost" customers are able to move as a result of imperfections in regulated rates.
- There could be a detrimental impact on utility cost of borrowing.
- There would be little in the way of competitive benefits since most customers would, as a practical matter, be uncontestable.

Q. WOULD YOU PLEASE SUMMARIZE THE REGULATORY CONSEQUENCES OF THE WIREBURY PROPOSAL.

A. I would expect a substantial increase in regulatory responsibilities for the following reasons:

- There could be many applications for distribution licenses and rates.
- There could be many more "utilities" to regulate.
- Complex locational distribution tariffs could emerge.
- Capital expenditures would likely require increased regulatory scrutiny.
- There are likely to be disputes over "predatory behavior" which would need to be adjudicated.

As a result, regulatory costs to all parties would rise.

4.4 Overlapping Service Areas and Other Service Area Amendments

Q. ARE THE OTHER APPLICATIONS BEFORE THIS BOARD QUALITATIVELY SIMILAR TO APPLICATIONS FOR NEW EMBEDDED UTILITY STATUS?

A. Those proposals for service area amendments which involve expansions into *contiguous* territory differ from proposals for new embedded distributors in at least two fundamental ways.

First, the applicants typically are established utilities that serve a contiguous area. Second, if expansion is into a bordering region, the issue of creation of discontiguities is not present. Thus, while the arguments against the Wirebury model are compelling, service area amendment proposals which do not create discontiguities require consideration of a more subtle set of issues.

Nevertheless, all the applications have one very important common feature -- none will create sustained competition in distribution for the simple reason that once connected, the overwhelming majority of customers will be uncontestable.

Q. ARE CURRENT SERVICE AREA BOUNDARIES OPTIMAL?

A. The evolution of the structure of distribution in Ontario was driven largely by demographics. Municipal utilities emerged and grew as population grew and became concentrated in one area or another. Ontario Hydro Retail (now part of Hydro One), played a critical role as the residual distributor, serving the vast rural expanses of the Province as well as a number of large direct customers. This link between the spatial distribution of population and utility service areas led to a more or less rational, if imperfect, evolution of the sector, though, as the Macdonald Committee identified, by the 1990's, there were too many small distributors in the Province.

Nevertheless, despite this more or less rational process, historically established service area boundaries may not be optimal in all cases. For example, sub-optimality can occur if an emerging concentration of customers is more easily served by a neighboring utility. If it is unlikely that the incumbent's distribution system will expand to encompass the new concentration in the foreseeable future, it may be appropriate to revise service territory boundaries.

Q. SHOULD SERVICE AREA AMENDMENTS BECOME A ROUTINE AND COMMON OCCURRENCE?

A. No, I do not believe this would be appropriate. Service area amendments should be undertaken only if a compelling case can be made that the proposed changes serve the public interest. Without a substantial degree of certainty concerning future patterns of customer growth, capital and system planning could be impaired.

In the current setting, capital planning by distributors takes into consideration the expected geographic distribution of current and future customers in the entire service area.

On the other hand, if there is uncertainty as to the service area, utilities serving the interests of current customers and shareholders, cannot be expected to expend resources on future customers they may or may not acquire. The combination of increased uncertainty and "lumpiness" of capital investments can lead to sub-optimal decisions. Thus, limiting the uncertainty about service area amendments would have a favorable impact on system planning.

Q. HOW CAN THE REGULATOR REDUCE OR LIMIT THE UNCERTAINTY WITH RESPECT TO FUTURE SERVICE AREA AMENDMENTS?

A. First, it would be desirable if the regulator would have a clearly expressed position on how the distribution industry should evolve over time. If it is the regulator's view that the current pattern of service areas is close to optimal, then it would be beneficial for utilities (and their creditors) to be aware of this. On the other hand, if it is the regulator's objective to promote further rationalization, or if the regulator believes that a substantial degree of restructuring is desirable, this should be stated clearly.

Second, it would be very beneficial if the regulator were to establish a clear set of conditions under which a service area amendment would be considered and what standards would need to

be met. In order to discourage capricious applications, it would seem that the burden of proof should lie with the applicant.[18]

Q. SHOULD OVERLAPPING SERVICE AREAS BE PERMITTED?

A. In my opinion, overlapping service areas should not be permitted, except perhaps on a temporary basis or by mutual agreement of neighboring utilities. First, much like new embedded distributors, overlapping service areas are likely to contribute to the dilution of customer density. Second, they could result in sub-optimal planning and capital expenditures as "competing" utilities "race for the border" or engage in other gaming to try to capture current or future customers.

If it is unlikely that the incumbent utility will be able to economically service the area under consideration in the foreseeable future, then an application should be made for a change in service area boundaries.

Q. ARE THERE GENERAL GUIDING PRINCIPLES WHICH CAN GUIDE SERVICE AREA AMENDMENTS FOR CONTIGUOUS UTILITIES?

A. First, service area amendments should not compromise scale or density economies of distributors. Discontiguities should not be created except in exceptional cases.

Second, regulatory uncertainty about service area amendments should be minimized to the extent possible. It would be desirable if the regulator would have a clearly expressed position on how the distribution industry should evolve over time. It would also be very beneficial if the regulator were to establish a clear set of conditions under which a service area amendment would be considered and what standards would need to be met.

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[18] For example, in the case of Wirebury, the applicant should provide quantitative analyses in support of the guiding principles it advocates, which would demonstrate that the enterprise serves the public interest and does not have an adverse impact on the spatial pattern of service territories.

Third, service area amendments should not be a routine and common occurrence. They should be undertaken only if a compelling case can be made that the proposed changes serve the public interest.

Fourth, the rules for service area amendments should lead to stable and predictable changes in industry structure.

Fifth, service area amendments should be considered if they tend to improve the economic efficiency of service territory boundaries or if they are likely to have a strong beneficial impact on regulatory efficiency.

4.5 Existing Competitive Forces Within the Distribution Sector and Performance Based Regulation

Q. ARE THERE ANY MARKETS IN WHICH DISTRIBUTORS ENGAGE IN COMPETITION?

A. The natural monopoly characteristics of electricity distribution leave little scope for direct competition between distribution companies in the product market. However, distributors do compete for funds in capital markets. Companies compete for the funds of investors by demonstrating superior performance. Those companies that succeed see their bond ratings improve, their cost of debt decline and, and if they are publicly traded, their share prices rise. They may also be able to attract and retain higher quality staff. Those companies that under-perform see their debt ratings deteriorate and may have difficulty in raising funds. They may lose their best staff members. Eventually such companies may be taken over by more effective owners and managers. Thus, while distributors do not face competition in the product market, they compete against each other in capital and labour markets.

Q. HOW DOES THE FINANCIAL COMMUNITY ASSESS THE PERFORMANCE OF DISTRIBUTORS?

A. Key determinants of financial performance include profit or net income levels, growth rates and the stability and predictability of earnings. In turn, profits depend on the one hand on costs, and on the other hand on revenues. Broadly speaking, costs are within the control of the companies – at least, it is here that the effects of superior or inferior management are mainly to be found. Revenues, on the other hand, are largely determined by the nature of the regulatory constraints. Increased uncertainty with respect to the future revenue stream, generally has a detrimental impact on the utility's credit rating.

Thus, regulatory decisions with respect to service areas can have a significant effect on the financial performance of the company.

Q. WHAT ROLE DOES PERFORMANCE BASED REGULATION PLAY IN CREATING INCENTIVES FOR EFFICIENT PERFORMANCE?

A. In the absence of the possibility of direct competition, regulators in many jurisdictions have sought to create incentives for improving efficiency. Performance or incentive based regulation has been developed as a mechanism which can produce such incentives and provides a more effective way of driving efficiencies than the cost-based and rate of return methodologies that have been in long use. As the Ontario Energy Board has indicated,

> "Customers benefit from PBR through the prescribed productivity factor and from potential gains through increased efficiency. By creating incentives that normally accrue in a competitive market, PBR brings the benefits of competition, and preserves the important service quality standards."[19]

In its Performance Based Regulation Decision of January 18, 2000 (RP-1999-0034), the Board found,

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[19] Ontario Energy Board Electricity Distribution Rate Handbook, Section 2.3.1

"2.1.14. By way of commentary, the Board observes that PBR is not just light-handed cost of service regulation. For the electricity distribution utilities in Ontario, PBR represents a fundamental shift from the historical cost of service regulation. It provides the utilities with incentive for behaviour which more closely resembles that of competitive, cost-minimizing, profit-maximizing companies. Customers and shareholders alike can gain from efficiency enhancing and cost-minimizing strategies that will ultimately yield lower rates with appropriate safeguards for service quality. Under PBR, the regulated utility will be responsible for making its investments based on business conditions and the objectives of its shareholder within the constraints of the price cap, and subject to service quality standards set by the Board."

The Decision also refers to the Provincial Government's White Paper on electricity restructuring (discussed in further detail in section 5.3 below). At paragraph 2.1.6, the Board states,

"The Board notes that some parties questioned the purpose of embarking on a PBR regime. In its policy document on the electricity industry restructuring, Direction for Change, 1997, the Government proposed "to direct the Board to examine, advise on, and subsequently implement a performance-based approach to regulation that ensures efficiencies are achieved in the monopoly parts of the industry and results in benefits to customers. The Government's goal is tariffs that are as low as possible on a sustainable basis".

The Ontario Energy Board, and the Government of Ontario have clearly recognized that electricity distribution is not a competitive activity; PBR allows for the creation of efficiency incentives in a monopoly environment.

5. ONTARIO GOVERNMENT POLICY

5.1 Overview

Q. PLEASE SUMMARIZE YOUR ASSESSMENT OF GOVERNMENT POLICY WITH RESPECT TO COMPETITION IN THE DISTRIBUTION SEGMENT OF THE ELECTRICITY INDUSTRY IN ONTARIO.

A. Ontario Government policy documents over the past number of years have consistently recognized that the "wires" portion of electricity distribution is a natural monopoly and not susceptible to meaningful direct competition. There has been broad recognition of the importance of scale economies in the industry. In order to further exploit these economies, the intent of Government policy and legislation has been to create incentives for judicious amalgamations within the distribution segment and not for fragmentation. In recognition of the need for effective regulation of distribution monopolies, the Government has expressed support for incentive or performance based regulation.

5.2 The Macdonald Committee Report

Q. DID THE MACDONALD COMMITTEE REPORT ENVISAGE COMPETITION IN THE WIRES BUSINESS?

A. The Committee did not envisage direct competition between utilities in the distribution wires business. The Committee did envision such competition in other services that were or could be provided by distributors, and for this reason, explicitly recommended the separation of a distributing utility's monopolistic wires business from its competitive electricity sales and energy services activities.

The Committee was explicit in its recognition of the natural monopoly character of distribution. It stated:

> "Since two or more sets of parallel wires are unlikely ever to be permitted along the same poles or in the same underground conduits, the Advisory Committee views the wires

portion of the distribution system as a natural monopoly. For this reason, the distribution system also needs to be subject to some degree of regulatory scrutiny for rates and service quality, much like the transmission grid."[20]

Non-discriminatory access, in turn was seen as a mechanism which would facilitate competition in other segments of the industry, for example, retail supply. Contrary to what Wirebury appears to be suggesting, non-discriminatory access was never intended to refer to competition amongst electricity distributors in the wires business.

Q. WHAT WERE THE RECOMMENDATIONS OF THE MACDONALD COMMITTEE WITH RESPECT TO THE DISTRIBUTION OF ELECTRICITY IN ONTARIO?

A. The Advisory Committee recommended that the distribution sector be restructured based upon principles which included the following:

- that Ontario Hydro Retail be absorbed into the local distribution system;
- that there be fewer distribution utilities; and,
- that each distribution utility keep separate its monopolistic wires business from its competitive electricity sales and energy services activities.[21]

In addition, the Macdonald Committee recommended that the resulting distributing utilities have a "shoulder-to-shoulder structure, following county/regional lines and not just local municipal boundaries." The Committee counseled that in any restructuring of boundaries, no serviced area should be left without service. [22]

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[20] A Framework for Competition, The Report of the Advisory Committee on Competition in Ontario's Electricity System to the Ontario Minister of Environment and Energy, page 105. The Report is informally known as the Macdonald Committee Report.

[21] Ibid, Summary of Recommendations, page v.

[22] Ibid., Summary of Recommendations, page vi.

Q. WHAT RECOMMENDATIONS DID THE COMMITTEE MAKE FOR CREATING EFFICIENCY INCENTIVES WITHIN THE DISTRIBUTION SEGMENT OF THE INDUSTRY?

A. While the Committee did not envisage direct competition, it did see incentive creation for the network segments of the industry as an important public policy objective. As such, it specifically recommended incentive or performance based regulation for the wires businesses because it would give companies greater incentive to reduce costs and improve efficiency. [23]

5.3 The Provincial Government White Paper

Q. DID THE WHITE PAPER ENVISAGE DIRECT COMPETITION IN ELECTRICITY DISTRIBUTION?

A. No. The White Paper specifically states that "transmission and local distribution remain natural monopolies, and are not amenable to direct competition."[24]

Q. WHAT OBJECTIVES DID THE GOVERNMENT SET FOR ELECTRICITY DISTRIBUTION?

A. Two key objectives directly related to electricity distribution were:

- to separate monopoly operations from competitive businesses throughout the electricity sector;
- to encourage cost savings in the local distribution sector. [25]

The Province's emphasis was on "creating a cost-competitive distribution sector to support Ontario's industrial competitiveness."[26]

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[23] Ibid., page 105.

[24] "Direction for Change: Charting a Course for Competitive Electricity and Jobs in Ontario", page 18.

[25] Ibid., page viii.

Q. IS THERE ANY INDICATION IN THE WHITE PAPER THAT THE GOVERNMENT RECOGNIZED THE POTENTIAL FOR ACHIEVING FURTHER SCALE ECONOMIES IN THE DISTRIBUTION SECTOR?

A. Yes. In this regard, the White Paper states,

> "Ontario has more than 300 local distribution utilities. Experience elsewhere suggests that significant economies could be achieved in the system, as a whole, through the amalgamation of smaller utilities and the adoption of "best practice" methods." [27]

Q. IS THERE ANY EVIDENCE IN THE WHITE PAPER WHICH WOULD SUGGEST THAT IT WAS THE INTENT OF THE GOVERNMENT TO FACILITATE THE CREATION OF NEW EMBEDDED UTILITIES SERVING MULTIPLE DISCONTIGUOUS AREAS, OVERLAPPING DISTRIBUTION SERVICE AREAS OR OTHERWISE FRAGMENTING THE DISTRIBUTION SYSTEM?

A. I was unable to find any reference in the White Paper to the creation of such embedded utilities or overlapping service areas. Indeed, the White Paper comments that Ontario has "one of the more fragmented distribution systems".[28]

Q. WHAT STEPS DID THE WHITE PAPER PROPOSE FOR FURTHER RATIONALIZATION OF DISTRIBUTION?

A. In this connection, the White Paper states:

> "The Government agrees with the Advisory Committee [i.e., the Macdonald Committee] on the need for efficiency improvements and consolidation in electricity distribution. It has

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[26] Ibid., page 12.

[27] Ibid., page 12.

[28] Ibid., page 9.

concluded that geographic rationalization in the distribution sector should proceed on a commercial and voluntary basis.

The municipal utilities, as a group, recognize the need to consolidate organizations and achieve economies in their operations. The Government is encouraged that several restructuring studies have already been initiated at the local level across the province. The Government's proposal to introduce full retail competition starting in 2000 is a strong signal to the local utilities to proceed rapidly with a voluntary restructuring of their operations.

The Government's expectation is that municipal electrical utilities will achieve significant geographical consolidations over the next five years. The Government will work with the Ontario Municipal Electric Association, Ontario Hydro and its successor companies, the Ontario Energy Board, and others to develop benchmarks and guidelines for efficiency, reliability and accountability to facilitate locally-driven reforms.

The Government believes that restructuring should be controlled mainly by communities themselves, working closely with one another, the Province, and the local businesses. Under the Government's plan, when consensus on amalgamation among utilities cannot be reached, the Ontario Energy Board would be available, at the request of the utilities, to facilitate the process and ensure that the interests of the consumer are met."[29]

Q. WHAT STEPS DID THE GOVERNMENT TAKE TO FACILITATE CONSOLIDATION IN DISTRIBUTION?

A. Since the enactment of the *Energy Competition Act, 1998*, the Government has created two, two-year transfer tax windows (the first ending in November, 2000 and the second, now open, ending in March, 2005) that would encourage consolidation in the distribution sector. The first transfer tax window resulted in the reduction in the number of distributors from over 300 to less than 100.

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[29] Ibid., page 20.

5.4 The Market Design Committee

Q. WHAT WERE THE CONCLUSIONS OF THE MARKET DESIGN COMMITTEE WITH RESPECT TO "CUSTOMER CHOICE" IN DISTRIBUTION?

A. As part of its complex and extensive consultations and deliberations, the Market Design Committee established the Retail Technical Panel (RTP). That Panel considered the possibility of customer choice and competition in the distribution segment of the industry. It commented as follows:

> "The RTP discussed the benefits of allowing customers to choose if they were closer to another distributor or adjacent to two distribution lines. If customers have choice and costs are reflected properly in the regulated rates for connection and distribution services, economics would dictate the outcome. However, it was noted that distribution service is a regulated monopoly; and allowing customer choice implies that it is a competitive service. Furthermore, making a natural monopoly competitive could result in system inefficiencies. There also may be situations in which one distributor may not have the ability or desire to connect a customer who could be serviced by another. Although allowing customer choice might have attractive attributes, the messy practicalities of implementing customer choice among multiple distribution systems seem to outweigh the benefits."[30]

It should be emphasized that the Market Design Committee was not considering these distribution-related issues in isolation. Its mandate, as stated in the cover letter to the First Interim Report of the Market Design Committee, March 31, 1998 was to "provide recommendations to the Government on the design of an Independent Market Operator (IMO), as defined in the White Paper, and to propose the rules and protocols that will be needed to launch a fully competitive electricity market in Ontario in the year 2000". The Committee was fully cognizant of the desirability of creating competitive markets. Despite this, it counseled against direct competition in distribution.

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[30] Final Report of the MDC: January 15, 1999 – Market Design for Retail Competition: Retail Technical Panel Report to the Ontario Market Design Committee, Appendix 6, page 6-7.

Moreover, consistent with the Macdonald Committee Report and the White Paper, the RTP recognized the distinction between monopoly and competitive activities in distribution, and devoted an entire subsection (6.5) of its report to separation-related matters.

Q. WHAT WERE THE CONCLUSIONS OF THE RETAIL TECHNICAL PANEL REGARDING THE EXCLUSIVITY OF DISTRIBUTION SERVICE AREAS?

A. The Retail Technical Panel concluded that exclusive franchise areas should be granted. It stated:

> "Complications arise if distributors do not have exclusive rights to a geographical location. For example, multiple distributors could attempt to provide service in the same area, resulting in economic inefficiencies. The obligation to connect also may be more complicated if a building lies adjacent to both lines. If a building lies along two different distribution lines, which distributor has the obligation to connect? What if one distributor does not have the capacity to service another customer? Detailed rules would have to be made concerning which distributor has precedence or whether, in these cases, customers have the right to choose between them....
>
> Exclusive service territories present some complexity with respect to legislation. An exclusivity provision may not cancel the statutory obligation to connect set forth in section 28 of the Electricity Act, 1998. [However, a licence awarded through an order of the Board is a "good and sufficient defence" to any proceeding brought or taken against any person in so far as the act is in accordance with the order (OEB Act, 1998, section 25).] Thus, a distributor with a line that runs near a building may have a statutory obligation to connect even if it is not licensed to service the territory of the customer. Despite the legislative tension, the RTP feels that the following recommendation provides the clearest approach, particularly for purposes of delineating the parameters of a distributor's obligation to connect.
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> **Recommendation 6-2**: The RTP recommends that distribution service territories be defined according to geographical boundaries and that each distributor be granted the

exclusive right to provide service within that territory. Such exclusive right would include the right to permit load transfers in appropriate cases, as discussed below."[31]

5.5 The "Review of Ontario Electricity Bills"

Q. DID THE "REVIEW OF ONTARIO ELECTRICITY BILLS" COMMISSIONED BY THE FORMER ENERGY MINISTER CONTAIN ANY FINDINGS RELEVANT TO THE ISSUES BEING EXAMINED IN THIS HEARING?

A. In December 2002, the Minister of Energy ordered "an independent review of all amounts charged to Ontario consumers on their electricity bills". Mr. Badali, the consultant retained by the Minister, was to examine the reasonableness of charges, having regard to "the 'bottom line' for consumers; consistency among charges for similar items on electricity bills across the province; the need to have stable and affordable electricity rates for consumers in Ontario; the importance of having electricity bills that all consumers can easily read and understand; and such other considerations as the Minister of Energy may from time to time assign to the Reviewer."[32]

One of the recommendations was that the distribution industry "Explore options for reducing fixed and variable distribution charges; given the large number of LDCs in the Province. Further consolidation of the market, regionalization and/or shared services initiatives may drive efficiencies." In addition the report concluded that "Performance Based Regulation (PBR) should continue in the Ontario electricity market."[33]

There is no suggestion in the report that the creation of new embedded distributors will contribute to efficiencies in the sector.

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[31] Ibid., pages 6-7, 6-8.

[32] Salvatore M. Badali, FCA: Review of Ontario Electricity Bills, Deloitte Consulting, March 1, 2003, Appendix A: Terms of Reference

[33] Ibid., page 3

6. CONCLUSIONS

6.1 Summary of Conclusions

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS.

A. My central conclusions are as follows. I have earlier provided more detailed arguments supporting each of them:

1. Some of the proposals put before this Board could establish guiding principles which would profoundly alter the nature and structure of the distribution.

2. The model proposed by Wirebury which would establish one or more utilities serving multiple discontiguous areas is wholly inappropriate and should be rejected. It would compromise economies of scale, density and contiguity; it would yield very limited competitive benefits because the created utilities would be natural monopolies and customers would continue to be uncontestable; it would substantially increase regulatory burden; it would complicate capital planning and potentially induce sub-optimal network investment; and, it could induce structural instability within the industry.

3. Overlapping service areas should not generally be permitted as they could result in inefficient capital expenditures. If it is unlikely that the incumbent utility will be able to economically service the area under consideration in the foreseeable future, then an application should be made for a change in service area boundaries.

4. Expansions into contiguous territories may be appropriate but they need to be assessed from the broader perspective of the appropriate evolution of the structure of the distribution system in Ontario. In assessing such proposals, the following considerations should be kept in mind:

    - service area amendments should not compromise scale, density or contiguity economies of distributors;

- regulatory uncertainty about service territories should be minimized; a clear expression from the regulator on how the distribution industry should evolve would be most desirable; moreover, a clear set of conditions under which amendments would be considered would also be of great benefit;

- service area amendments should not be a routine and common occurrence; they should be undertaken only if a compelling case can be made that the proposed changes serve the public interest;

- the rules for service area amendments should lead to stable and predictable changes in industry structure.

6.2 The Broader Perspective

Q. DO YOU BELIEVE THAT THE ELECTRICITY INDUSTRY IN ONTARIO IS INEXORABLY MOVING TOWARDS COMPETITION?

A. In Ontario, as in many other jurisdictions, the move to create competition in generation and supply of electricity has stalled. Indeed, it would appear that we have gone from regulation to deregulation to re-regulation.[34] Authorities were prompted to reverse course largely because of politically costly increases in the price of electricity and because of the high-profile failure in California.[35]

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[34] For example, the Ontario Energy Board will have new authority to fix electricity commodity prices pursuant to the OEB Amendment Act (Electricity Pricing) introduced by Minister Dwight Duncan on November 25, 2003.

[35] One might ask why consumers and voters are willing to tolerate large swings in gasoline prices but not electricity prices? One reason is that electricity price increases have often occurred shortly after de-regulation, so that there was a broad perception that the government could do something about it. That is, there was a tangible alternative model in the minds of consumers and voters – the *status quo ante*. A second, and perhaps more important reason is that gasoline has "substitutes". When its price goes up, consumers can often find cost-effective alternatives (such as public transit or car-pooling). Electricity, on the other hand, has very limited alternatives in the short run. The demand for electricity is thus substantially less price-elastic in the short run than gasoline. (Empirical studies have also found that demand for electricity is less price elastic than natural gas.)

In my view, new momentum for deregulation will be generated when one of the competitive models, (e.g., the U.K. model), is clearly seen to produce large sustained benefits. Until the potential for benefit substantially outweighs the political risk, I expect many jurisdictions to continue to be cautious. In Ontario, it is at best unclear that we will soon embark on an ambitious process of de-regulation of the generation segment of the industry.

Q. WHAT ALTERNATIVE TO COMPETITION IN GENERATION AND SUPPLY WOULD BEST SERVE THE PUBLIC INTEREST AT THIS TIME?

A. In my opinion, *the best alternative to competition is efficient regulation.* Incentive based regulation has been shown to be effective in a number of industries. It can be implemented more fully in Ontario.

Moreover, *the generation segment of the industry could be restructured to position the industry for future competition.* Suitable restructuring of generation could not only create competitive pressures, but could also provide reassurance to potential private generators. [36]

In this context, it would seem the best strategy for the wires portion of the industry – including the distribution segment -- would be to continue on the path of performance based regulation to drive efficiency improvements and to ensure that the wires business provides a stable and cost-effective network platform for future developments in the potentially competitive segments of the industry.

[36] Elsewhere, in joint work, I have also suggested that further unbundling of transmission and distribution in Ontario would be beneficial. See Stephen Littlechild and A. Yatchew, 2002: "Hydro One Transmission and Distribution: Should They Remain Combined or be Separated", available at www.chass.utoronto.ca/~yatchew